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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

MICHALSKI, JUSTIN I

ART UNIT PAPER NUMBER

2644

DATE MAILED: 10/20/2004

21

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/637,821

Applicant(s)

JOHNSON ET AL.

Examiner

Justin Michalski

Art Unit

2644

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 July 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-54 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-54 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date: _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. In view of the appeal brief filed on 23 July 2004, PROSECUTION IS HEREBY REOPENED. New grounds of rejections set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

- (1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,
- (2) request reinstatement of the appeal.

If reinstatement of the appeal is requested, such request must be accompanied by a supplemental appeal brief, but no new amendments, affidavits (37 CFR 1.130, 1.131 or 1.132) or other evidence are permitted. See 37 CFR 1.193(b)(2).

Claim Objections

2. Claim 48 is objected to because of the following informalities: On line 2 the word "has" is misspelled. Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-3, 5, 6, 13-16, 18, 19, 22, 23, 29, 30, 32, 37-40, and 45-49 are rejected under 35 U.S.C. 102(b) as being anticipated by Klippel (US Patent 5,815,585) (Hereinafter "Klippel '585").

Regarding Claims 1 and 37, Klippel '585 discloses an apparatus and method (Fig. 1) for modifying an electrical audio signal for input to a sonic reproduction device that includes a speaker (1) characterized by a plurality of individual responses which in combination define an overall response for the sonic reproduction device (Fig. 2, filters 19-23 correspond to individual responses (Col. 6, lines 13-45), each individual response comprising at least one of a frequency, time, phase or transient response, said apparatus comprising: a plurality of modification filters (Fig. 1, filters 19-23) having modification responses that simulate the plurality of individual responses, at least one said modification filter simulating an individual component of the speaker (Klippel '585 discloses filters simulating voice coil resistance, voice coil inductance, and force factors; Col. 6, lines 13-45), the modification filters for receiving the electrical audio signal (8), modifying the electrical audio signal (references 2, 3, and 6) and providing the electrical audio signal to the sonic reproduction device (9 and 10); and a plurality of adjustable parameters (adaptive circuits 19-23), each associated with at least one of the modification filters (19-23) for allowing adjustments to the responses of the modification filters; wherein the adjustments create a plurality of individual conjugate responses (Klippel '585 discloses filter inverse transfer characteristics; Col. 1, lines 1-6), each individual conjugate response associated with at least one of the plurality of individual responses.

Regarding Claim 13, Klippel '585 discloses a sound compensation system (Fig. 1) for altering an electrical audio signal for input to a sonic reproduction device including a speaker (1) and having associated behavioral characteristics (Klippel '585 discloses voice coil resistance, voice coil inductance, and force factors; Col. 6. lines 13-45), said system comprising: a model of the sonic reproduction device having a plurality of filters that simulate at least one of the behavioral characteristics of the sonic reproduction device (Fig. 2, filters 19-23), each filter having an associated response that combine to define an overall response for the model, at least one said filter simulating an individual component of the speaker (Klippel '585 discloses filters simulating voice coil resistance and force factors; Col. 6. lines 13-45), each response comprising at least one of a frequency, time, phase or transient response; and a controller (adaptive detector circuit 2 and adaptive circuits 19-23) that modifies the response of each of the plurality of filters to transform the filter into a conjugate filter having a response that is conjugate to the original response of the filter (Klippel '585 discloses filter inverse transfer characteristics; Col. 1, lines 1-6).

Regarding Claims 22 and 23, Klippel '585 discloses filters simulating voice coil inductance (i.e. related to magnetic structure and voice coil of speaker); Col. 6. lines 13-45.

Regarding Claim 29, Klippel '585 discloses a sonic reproduction device having associated mechanical, acoustic and electromagnetic behavioral characteristic (Klippel '585 discloses voice coil resistance, voice coil inductance, and force factors; Col. 6. lines 13-45); a source for outputting an electrical audio signal to a model of the sonic

Art Unit: 2644

reproduction device (speaker 1), the model having a plurality of filters that simulate at least one of the mechanical, acoustic, and electromagnetic behavioral characteristics of the sonic reproduction device, at least one said filter simulating an individual component of a speaker of the sonic reproduction device, each filter having an associated response comprising at least of a frequency, time, phase, or transient response, the model outputting the electrical audio signal to the sonic reproduction device (Klippel '585 discloses filters simulating voice coil resistance, voice coil inductance, and force factors; Col. 6. lines 13-45); and a controller (adaptive detector circuit 2 and adaptive circuits 19-23) that modifies the responses of the filters to transform the model into a conjugate model having a plurality of filters with responses that comprise conjugates to the original response of the filter (Klippel '585 discloses filter inverse transfer characteristics; Col. 1, lines 1-6).

Regarding Claim 45, Klippel '585 discloses a method of altering an electrical audio signal for input to a sonic reproduction device having a speaker and associated behavior characteristics, said method comprising the steps of: simulating at least one of the behavioral characteristics of the sonic reproduction device with a plurality of filters (Klippel '585 discloses filters 19-23 simulating voice coil resistance, voice coil inductance, and force factors; Col. 6. lines 13-45), at least one said filter simulating an individual component of the speaker (i.e. voice coil resistance, voice coil inductance, and force factors), each filter having an associated response comprising at least one of a frequency, time, phase, or transient response; and for each of the filters, modifying the response of the filter to transform the filter into a conjugate filter having a response that

comprises a conjugate to the original response of the filter (Klippel '585 discloses filter inverse transfer characteristics; Col. 1, lines 1-6).

Regarding Claim 2 and 38, Klippel '585 further discloses the plurality of individual responses (Klippel '585 discloses simulating voice coil resistance, voice coil inductance, and force factors; Col. 6, lines 13-45) of the sonic reproduction device are related to mechanical, acoustic, and electromagnetic behavior of the sonic reproduction device.

Regarding Claim 3, 16, and 30, Klippel '585 further discloses filters defined by digital processes (Col. 2, lines 39-41) which are inherently controlled by a computer.

Regarding Claims 5, 32, and 39 Klippel '585 further discloses (Fig. 2) filters 19-23 are independent of each other (i.e. non-interacting).

Regarding Claims 6 and 40, Klippel '585 further discloses the plurality of modification responses combine to form an overall transfer characteristic (i.e. response) that is a conjugate to the overall response for the sonic reproduction device (Col 1, lines 58-60).

Regarding Claim 14 and 46, Klippel '585 further discloses the behavior characteristics are defined by the voice coil and electrodynamic transformer, i.e. individual components (Col. 5, lines 13-16).

Regarding Claim 15 and 47, Klippel '585 further discloses the behavior characteristics are defined by the voice coil and electrodynamic transformer which are inherently made of groups of individual components (Col. 5, lines 13-16).

Regarding Claim 18, Klippel '585 further discloses the sonic reproduction device comprises a speaker (1) and at least one of the plurality of filters comprises at least one

associated adjustable parameter and the value of the parameter is calculated based on a physical characteristic of the speaker (Klippel '585 discloses adaptive filters 19-23 simulating voice coil resistance, voice coil inductance, and force factors (i.e. physical characteristics); Col. 6. lines 13-45).

Regarding Claim 19, Klippel '585 further discloses the physical characteristics of the speaker (voice coil resistance, voice coil inductance, and force factors Col. 6. lines 13-45) which comprises mechanical compliance, damping, and moving mass characteristics.

Regarding Claim 48, Klippel '585 further discloses the sonic reproduction device comprises a speaker (1) and at least one of the plurality of filters has at least one associated adjustable parameter and the step of modifying the response of the filter comprises steps of: calculating the value of the at least one adjustable parameter value based on the physical characteristics of the speaker; and setting the parameter to the calculated value (It is inherent that adaptive filters 19-23 which correspond to voice coil resistance, voice coil inductance, and force factors (i.e. physical characteristics) are adapted (i.e. calculated) and set to values.

Regarding Claim 49, Klippel '585 further discloses the physical characteristics of the speaker (voice coil resistance, voice coil inductance, and force factors Col. 6. lines 13-45) which comprises mechanical compliance, damping, and moving mass characteristics:

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 4, 7, 8, 17, 31, 33, and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Klippel '585.

Regarding Claims 7, 8, 33, and 41, Klippel '585 discloses use of modification filters but does not explicitly disclose cut-off filters. It is inherent that the filters will have a cut-off frequency at some values in order to modify the audio signal. It is well known in the art the center frequency of a filter is related to the Q factor by $Q=f_0/BW$ where f_0 is the center frequency and BW is the bandwidth. It is inherent that frequency response of the filter will be responsive to center frequency and Q parameter.

Regarding Claims 4, 17, and 31, Klippel '585 discloses use of filters but does not disclose the filters being analog circuits. However, it is well known in the art that filters can be constructed with analog components.

7. Claims 9, 10, 34, and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Klippel '585 above in view of Simeau (US Patent 4,223,181).

Klippel '585 discloses an apparatus above but does not disclose the use of a constant slope equalizer filter. It is well known in the art that filters (i.e. equalizers) have constant slope responses to attenuate frequencies outside of a pass band as disclosed by Simeau with a constant slope of 18 dB/octave (Col. 4, lines 48-51).

8. Claims 11, 12, 24-28, 35, 36, 43, 44, 52-54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Klippel '585 above in view of Finn et al. (US Patent 6,295,364) (Hereinafter "Finn").

Regarding Claims 11, 12, 26-28, 35, 36, 43, and 44, Klippel '585 discloses an apparatus as disclosed above but does not disclose use of a parametric notch filter. Finn discloses filters corresponding to the inverse of the speaker transfer function (Col 3, lines 25-30) including the use of notch filters (Col 2, lines 40-55) to reduce resonance peaks. Therefore, it would have been well known in the art at the time the invention was made to include notch filters to reduce resonance peaks in the audio output. It is well known in the art the center frequency of a filter is related to the Q factor by $Q=f_0/BW$ where f_0 is the center frequency and BW is the bandwidth. It is inherent that frequency response of the filter will be responsive to center frequency and Q parameter.

Regarding Claims 24, 25, 52, 53, and 54, Klippel '585 discloses an apparatus as disclosed above but does not disclose monitoring program conditions at the sonic reproduction device. Finn discloses filters corresponding to the inverse of the speaker transfer function (Col 3, lines 25-30) including monitoring program levels (frequency response; Col 2, lines 30-34) at the sonic reproduction device (Fig. 1, microphone 8).

9. Claims 20, 21, 50, and 51, and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Klippel '585 above in view of Raczynski, Bohdan, "Active

Equalization of Loudspeakers" Speaker Builder, Feb. 1997, pps. 8-12 (Hereinafter "Bohdan").

Klippel '585 discloses an apparatus as disclosed above but does not disclose parameters being derived from a standard speakers model. Bohdan discloses deriving transfer functions by using acoustical-impedance models to be more complete than simplified models using formulas (Figure 1; Col 1, Paragraph 4). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a standard speaker model to produce a more complete model.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Justin Michalski whose telephone number is (703)305-5598. The examiner can normally be reached on 8 Hours, 5 day/week.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bill Isen can be reached on (703)305-4386. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JIM


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PRIMARY EXAMINER